Speaking and Signing English with Deaf Students: Morphemic Awareness and Reading Comprehension

NORTHEASTERN EDUCATIONAL RESEARCH ASSOCIATION

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Today I will present a research study . . .

- . . . on how explicit attention to the morphemes of words can foster the reading achievement of Deaf/hard of hearing (D/HH) students . . .

First, some background: Historically,

- D/HH students do not achieve the same level of reading achievement as their hearing peers (Spencer & Marschark, 2010).
- Cochlear Implants have not closed the gap for D/HH students (e.g. Spencer & Marschark, 2010)
- the early linguistic gains of young CI users dissipated at higher grade levels and
- reading achievement continues to plateau around the fourth grade level when students reach the intermediate-grades through high school years (Geers et al., 2007; Spencer & Marschark, 2010; Traxler, 2000)

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Potential reasons for plateau . . .

- Difficult for D/HH students to hear grammatically-accurate English, especially pronouns, articles and bound morphemes of English (Guo, Spencer, & Tomblin, 2013)
- Reading materials progressively get more difficult, words get longer and the demands of vocabulary increase; making comprehension more challenging (Carlisle, 2004; RAND Reading Study Group, 2002)

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Morphemes: Common in Text

Luetke (2013) analysis of basal stories (Harcourt, 2001)

1st Grade: 10 bound morphemes:

- dis-, -ed, -en, -ly, -ful, -ing, plural -s, possessive -s, third person -s, and –y

3rd Grade: 21 additional:

- -able, -an, -ant, -en, -er, -ible, -ic, -ice, in-, -ion, -ious, -its, -ity, -ment, mis-, -or, re-, -sion, -th, -tion, and un

5th Grade: 9 additional - all derivational

And

- Difficult to hear (Easterbrooks, et al., 2008)
- No access unless fingerspelled or signed during instructional and social conversations (Luetke, 2013)

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Instructing MA

Morphology *"relates differently to reading and writing in different languages… Nonetheless across languages, the central role of morphemes in word formation and lexical processing constitutes an initial argument for the potential value of instruction in morphological awareness"* (Carlisle, 2010, p. 485).

Explicit morphology instruction = Significant gains for:

- Hearing students (see Carlisle, 2010 for review)
- ELLs (e.g. Lesaux, Kieffer, Faller, & Kelley, 2010)
- D/HH students

(Bow, Blamey, Paatsch, & Sarant, 2004)

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Access to Morphemes of English

Mayer (2007) concluded as she discussed the literacy abilities of deaf children, *"it is not the presence of ASL but the absence of some form of face-to-face English that is at issue and the challenge for educators"* (p. 416).

Gaustad, Kelly, Payne & Lylak (2002) suggested SEE as a way to improve *the "insufficient morphographic skills of deaf students"* (p. 17)

Background: Potential of SEE

Signing Exact English (SEE) (Gustason & Zawolkow, 1993)

- morphology of words is made visible
- signs to code audibly insalient English:
  - articles, pronouns, conjunctions and bound morphemes (Guo et al., 2013)
- 80 affixes
- Differentiate derivations:
  - "electric" (e.g., "electrical," "electrician," "electricity," " electrify," and "nonelectrical")

S.E.E. Is A Bridge

between what a child partially hears…

…and what he/she says and expresses in English.

Purpose and Research Questions:

To investigate the English-language abilities and reading achievement of a sample of students who were D/HH and attended a school where staff and students communicated simultaneously in grammatically accurate Standard English via speech and Signing Exact English (SEE).

- Do the participants:
- demonstrate Standard English-language proficiency as measured by informal and formal tests?
- demonstrate reading achievement within the average range of their hearing peers?
- Are there significant correlations between speech and English-language and reading scores?
- Do participants' scores on English-language measures predict reading achievement as measured on a standardized assessment of reading achievement?

Participants

17 students who are D/HH (8 boys, 9 girls) all attend school for the D/HH (PreK-8), in metro area northwest US (population of the school: 45 students PreK(age 3)-grade 8)

- 7;6 years (2nd grade) to 13;9 years (8th grade)
- Diversity among the participants
  - Racially: 11 Caucasian, 3 Asian, 3 biracial
  - Socio-economic status: Varied
  - Other background variables: family structure, factors related to the parents (level of education and signing with their child, and school involvement).

Data Collected on Students

Hearing and assistive device use (i.e. CIs, hearing aids)

- Age of hearing loss, Unaided and aided hearing
- Assistive listening device use

Speech – *Photo Articulation Test* (PAT-3; Lippke, Dickey, Selmar, & Soder, 1997)

- 93 items, each describe a photo to prompt the use of a word with a target sound (initial, medial, or final position).
- Normed on 3-8 yr. olds children with normal hearing so calculated a raw score (number of correctly pronounced phonemes out of the total possible articulation targets

Language -Structured and unstructured language samples

- *Structured Photographic Expressive Language – SPELT)*
- Unstructured – collected in everyday classroom activities
- *Clinical Evaluation of Language Fundamentals* (CELF)
- Researcher-created morphemic awareness task (MA)

Reading - *Gates-MacGinitie Reading Test* (GMRT) (MacGinitie, MacGinitie, Maria, & Dreyer, 2000

Results: Speech was NOT related to Language

English Language Scores Within Grade Level Bands and Whole Group Averages

	Grades 2-3 (n=4)	Grades 4-8 (n=13)	All Participants
PAT (speech articulation)	98% correct	91% correct	93% correct
SPELT (structured sample)	38% correct	76% correct	67% correct
CELF-4 receptive	79.5	92.6	89.5
	range: 73-86	range: 67-121	range: 67-121
CELF-4 expressive	66.0	86.1	81.4
	range: 55-77	range: 53-110	range: 53-110
CELF-4 core	64.5	87.9	82.4
	range: 54-78	range: 58-118	range: 54-118

Note: Mean standard score for the CELF-4 is 100.

Results: Significant Correlations Between Language and Reading

	GMRT Vocab	GMRT Comp	GMRT Total
PAT (speech)	-.316	-.354	-.312
SPELT (struct. sample)	.796**	.604*	.718**
Unstruct. sample	.860**	.784**	.854**
CELF-4 Receptive	.754**	.709*	.771**
CELF-4 Expressive	.855**	.849**	.882**
CELF-4 Core	.861**	.789**	.859**

Two-tailed Pearson correlations - **significant at .01 level * significant at .05 level

Discussion

- Receptive and expressive English language skills correlated to all reading achievement – not surprising (e.g. Catts, Hogan & Adlof, 2005; Moores & Sweet; 1990; Oakhill & Cain, 2012)
- *As a group, reading achievement* was commensurate with hearing peers in contrast to the the common plateau finding (e.g. Mahoney et al., 2000; Spencer & Marschark, 2010)
- Of the 13 students, grade 4 and above, 85% read within 4th grade or higher

Discussion

"The morphological component of conversational competence in English is dependent on the mode and completeness of the models of English to which deaf students are exposed" (Gaustad & Kelly, 2004, p. 283).

- All staff at this school are explicit about the morphology of English through their use of SEE and they are given regular training and supervision to assess and maintain their skills, as Dr. Peg Mayer suggested.
- All staff expect students to use grammatically accurate, standard English. When they do not, the teachers and other staff use the "Again" strategy (Appelman, Callahan, & Lowenbraun, 1980).

We conclude…

- Reading achievement of elementary and middle school D/HH students need not plateau and can be commensurate with that of hearing peers.
- D/HH students need access to the morphology of English in order to decode the many and varied multisyllablic words in particularly prevalent content-area (math, science, social studies) reading materials in order to quickly process more-and-more advanced text.
- It is imperative that we in the profession examine the variables that may affect the achievement of D/HH students and advocate for changes in professional development and instructional practice.

Resources

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- McLean, M., Nielsen, D. C., Stryker, D., & Luetke, B. (Winter, 2014). Characteristics of students who read on grade level: What can teachers influence? *The Canadian Journal of Education of the Deaf. pp. 18-25, 36-37.*
- Appelman, K.; Callahan, J.; Mayer, M.; Luetke, B.; & Stryker, D. (Spring, 2012). A Comparison of Post-Secondary Measures of Success When Students are Deaf or Hard of Hearing. American Annals of the Deaf. Volume 157, Number 3, Summer 2012
- Nielsen, D. C., Luetke, B., & Stryker, D. (2011). The importance of morphemic awareness to reading achievement and the potential of signing morphemes to supporting reading development. *Journal of Deaf Studies and Deaf Education, 16*(3), 275-288. doi:10.1093/deafed/enq063

Data collected on :

Table 1
Student age, information on hearing, and language assessment (CELF) scores

Student	Age	Unaided Hearing Loss	Aided PTA	Equip. (number of years with it)	CELF Core Lang.	CELF Recep. Lang.	CELF Expt. Lang.
1	7.6	Moderate to severe	43	HA (6)	78	86	77
2	8.11	Severe to profound	83	HA (6)	54	73	55
3	9.5	profound	10	CI (9)	64	76	71
4	9.5	profound	20	CI (6)	62	83	61
5	9.11	profound	20	HA (8)	112	116	110
6	10.7	severe	20	HA (6)	97	96	96
7	10.8	profound	20	CI (5)*	96	102	96
8	10.9	profound	13	CI (8)*	72	79	77
9	10.11	profound	75	HA (7)	94	90	101
10	11.2	profound	20	CI (10)	98	90	99
11	11.5	profound	27	CI (9)*	62	67	53
12	11.8	profound	20	CI (5)*	91	96	89
13	11.8	profound	20	CI (6 *	64	79	57
14	11.11	profound	13	CI (8)*	58	76	61
15	12.5	profound	15	CI (10)*	69	85	63
16	13.7	profound	10	CI (12)*	112	121	108
17	13.9	severe to profound	40	HA (12)	118	107	110

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Background Characteristics of Students Reading within or Above Grade Level

Table 8
Background Characteristics of Students Reading Within or Above Grade Level

Grade	Unaided Hearing Loss	Age Loss ID	Acquisition Age HA or CI	Aided Loss dBs HA or CI	CELF Core %tile Within Average	Parent Sign Ability	Parental Involvement
3	profound	@ birth	CI @ 2 yrs	10/CI	No	Medium	High
4	profound	@ 3 yrs	HA @3 yrs	20/HA	Yes	Medium	High
4	severe	@ 5 mths	HA @ 5.5 mths	20/HA	Yes	Medium	Medium
4	profound	@ 13 mths	HA @ 1.5 yrs CI @ 6 yrs (fail) CI @ 7 yrs	20/CI	Yes	High	High
4	profound	@ 15 mths	HA @ 2 yrs CI @ 4 yrs	13/CI	No	Medium	Medium
5	profound	@ 4 yrs	HA R @ 4 yrs HA L @ 5 yrs	75/HA	Yes	Low	Medium
5	profound	13 mths	HA@15mths CI @ 2 yrs	20/CI	Yes	High	High
5	profound	2 mths	HA @ 4mths CI @ 8 yrs	20/CI	Yes	Medium	Medium
8	profound	9 mths	HA @9mths CI (L) @ 2 yrs CI (R) @ 11 yrs	10/CI	Yes	High	High
8	severe to profound	6 weeks	HA @ 8 weeks	40/HA	Yes	High	High

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